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Article

Food export restrictions during the COVID-19 pandemic: Real and potential effects on food security

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Conceptual Paper

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Food export restrictions during the COVID-19 pandemic: Real and potential effects on food security

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Abstract: The purpose of the article is to review and critique the implementation of food export restrictions in times of crisis in addressing food security challenges. The methodological approach was to undertake a narrative literature review to outline the challenge of ensuring food security in times of crisis. We explored the problem of food export restrictions introduced in 2007–2008 and 2020 and assessed the changes in the state of food security at the national level during the COVID-19 pandemic using the Global Food Security Index (GFSI). The trade restrictions imposed in 2020 did not play a key role in the increases in international food prices as was the case during 2007–2008 and 2010–2011. The analysis of GFSI values questions whether food export restrictions have been sufficient measures given the size of the food security challenge during the pandemic, and this is a new contribution of this research. The issue of food export restrictions is underregulated in the World Trade Organization (WTO), and this needs to be urgently addressed by another institution, e.g., Food and Agriculture Organization (FAO), given that the war in Ukraine is endangering food security across the world.

Keywords: COVID-19, FAO food price index, food export restrictions, food security, WTO

JEL Classification: F02, F13, Q18

1 Introduction

In 2020, the global society witnessed a setback in its hunger and malnutrition eradication efforts. The outbreak of the COVID-19 pandemic and the implementation of various mitigation measures moved away from the Sustainable Development Goal-2 (SDG-2) “Zero hunger” set in the 2030 Agenda [Food and Agriculture Organization of the United Nations (FAO) et al., 2021] by threatening all four pillars of food security, i.e., access, availability, stability, and utilization [Laborde et al., 2020a]. It is worth briefly restating the definition of food security, which “exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” and underline that the nutritional dimension is integral to this concept [Committee on World Food Security (CFS), 2014, p. 2]. After a decade of progress, global hunger levels have been rising since 2015 [FAO et al., 2019; Kowalski and Kowalska, 2022]. The FAO of the United Nations projected a rapid

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increase in the prevalence of undernourishment (PoU) in 2020, i.e., a change from 8.4% to 9.9% in one year [FAO et al., 2021]. This difficult situation regarding food insecurity has been exacerbated by the armed conflict taking place in Ukraine in 2022. Furthermore, most of the countries have been facing a double burden of malnutrition, which is defined as “*the coexistence of undernutrition along with overweight and obesity, or diet-related noncommunicable diseases, within individuals, households and populations, and across the lifecycle*” [World Health Organization (WHO), 2022]. The implementation of social distancing measures during the pandemic has influenced the lifestyle habits, including the eating patterns and physical activity habits. Several studies have shown an increase in the consumption of food products [European Institute for Innovation and Technology (EIT) Food, 2020; Dobrowolski and Włodarek, 2021] and a decrease in physical activity [Dobrowolski and Włodarek, 2021; Stockwell et al., 2021], but also an increased consciousness about nutrition-related health issues [*The Guardian*, 2020; Wojciechowska-Solis et al., 2022]. This gives rise to the key research question:

What is the outcome of food policy decisions taken in individual countries during the COVID-19 pandemic?

There are eight ambitious targets to be reached by 2030 embedded in SDG-2 regarding hunger, malnutrition, sustainable agriculture, technology development, information sharing, and trade restrictions. These include the following: (a) to end hunger and ensure access by all people, in particular, the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food throughout the year (Target 2.1); (b) to end all forms of malnutrition and address the nutritional needs of children younger than 5 years of age, adolescent girls, pregnant and lactating women, and the elderly (Target 2.2); (c) to ensure sustainable food production and implement resilient agricultural practices that increase productivity and production and strengthen the capacity for adaptation to climate change (Target 2.4); (d) to increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development, and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular, the least developed among them (Target 2.a); (e) to adopt measures to ensure the proper functioning of food markets and facilitate timely access to market information, including on food reserves, in order to reduce the volatility of food prices (Target 2.c); (f) to correct and prevent trade restrictions and distortions in global agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round (Target 2.b) [The Global Goals, 2022]. The sustainable development paradigm envisages the performance of the tasks assigned to the SDGs through enhanced international cooperation. All these considerations form the research rationale for why food export restrictions introduced during the COVID-19 pandemic are the focus of this research.

Both food security and sustainable development are public goods, and the responsibility for providing them is divided between different actors, such as governments, nongovernmental organizations (NGOs), private companies, and individuals [Oosterveer et al., 2014]. These parties act both individually and in cooperation with other stakeholders. A public good is a good that, once produced, can be consumed by another consumer at no additional cost, as described by economic theory. Furthermore, numerous consumers cannot be excluded from consuming the public good once it is provided. Thus, a pure public good has two specific features, i.e., nonrivalry of consumption (or jointness in consumption) and nonexcludability, respectively [Samuelson, 1954; Musgrave, 1959; Ostrom and Ostrom, 1977; Holcombe, 1997]. The problem is that if consumers cannot be excluded from consuming public goods, they will free-ride (consume without paying), which might result in underproduction of the goods in a private sector. Anomaly [2013, p. 110] points out that “*government can potentially improve the situation by directly supplying or indirectly encouraging the provision of public goods*”. Every human being has a right to adequate food, which is linked to the inherent dignity of the person [Kowalski and Kowalska, 2022], and this right places legal obligations on countries to ensure food security for all [the United Nations Human Rights Office for the High Commissioner (UN OHCHR), 2010]. Hence, all countries worldwide are obliged to support providing food security (as a public good) to their inhabitants both individually and through international cooperation. The need for the development of international assistance and cooperation comes from both the provisions of Article 2 of the

International Covenant on Economic, Social, and Cultural Rights of December 16, 1966 [Council of Europe, 2022] and the formulation of SDG-2 and related targets.

At the very beginning of the pandemic, the governments, particularly those of developing countries, were concerned about food shortages. In order to ensure food security for their inhabitants, food export-restrictive measures were introduced [Erokhin and Gao, 2020; Organisation for Economic Co-operation and Development (OECD), 2021; Wiśniewska and Wyrwa, 2022], and this calls for further research.

Hence, the aim of this article is to review and critique the implementation of food export restrictions in times of crisis in addressing food security challenges, having regard to the provisions of the General Agreement on Tariffs and Trade (GATT) and World Trade Organization (WTO) agreements.

2 Materials and methods

The methodological approach was to undertake a narrative literature review to define and outline the challenge of ensuring food security in times of crisis in accordance with WTO rules. The research was conducted in three steps. First, we searched Google Scholar to primarily consider current information on the consequences of “locking down” economies during the COVID-19 pandemic for the level of food security and then reviewed WTO documents to demonstrate the regulatory framework put in place by WTO concerning agricultural trade. Second, we explored the problem of food export restrictions that WTO members introduced in 2007–2008 and/or 2020, in particular, their root causes and consequences. Third, we assessed the changes in the state of food security at the national level using the Global Food Security Index (GFSI) and, accordingly, drew conclusions.

The quantitative data were derived from FAO, the WTO, the United States Department of Agriculture (USDA), the United States Agency for International Development (USAID), OECD, the International Food Policy Research Institute (IFPRI), the Ethiopian Agricultural Transformation Agency (ATA), the Famine Early Warning Systems Network (FEWS NET Zambia), the European Commission’s Directorate-General for Trade (DG Trade), the Government of Niger, the Tanzania National Food Reserve Agency (NFRA), and the WHO.

3 Results and discussion

3.1 The challenge of food security during the COVID-19 pandemic

Access to food was the food security dimension most affected by the COVID-19 pandemic [Béné et al., 2021]. This comprises both physical and economic accessibility of food, which is evaluated by answering the following question: can people obtain the food they need? [Laborde et al., 2020a; Manning, 2021] Béné et al. [2021] have pointed out in their review – covering 337 documents regarding the impact of COVID-19 on the food systems in 62 countries worldwide – that access to food was mainly threatened by losses of income and assets, losses of jobs, and the lower purchasing power of people who were severely affected by the mitigation measures implemented by the local and national authorities. Increases in international food prices, together with losses of income, caused a growth in the ratio between food prices and incomes and consequently lowered food affordability [FAO, 2022]. This situation caused undernourishment to rise through greater food insecurity and further deterioration of diets; hence, both portions and quality of food were affected [Laborde et al., 2020a; FAO, 2021a; Vos et al., 2022]. The global gross domestic product (GDP) per capita based on purchasing power parity (PPP) declined by 2.4% over the period 2019–2020. It means that the world economy has been facing the first recession since 2008 [The World Bank, 2022]. The poorest have been most severely affected by COVID-19 due, among other things, to the fact that they were rather unable to work remotely [Ortiz-Hernández and Pérez Sastré, 2020]. During the pandemic, the lowest-income people lost their most important (or their only) asset, i.e., labor. While the poorest have been commonly low-skilled or manual workers, richer individuals have had a set of productive assets, including capital and land, and have been able to work remotely [Swinnen and McDermott, 2021].

Global public goods are meant to serve humanity as a whole, regardless of nationality, country of residence, population group, or generation [Kaul et al., 1999]. Food security is a global public good since it benefits for the entire humanity, irrespective of the level of individual economic well-being [Timmermann, 2018]. While national tax regimes serve to provide national public goods, there is no global institution that plays a similar role as the state does. Furthermore, the benefits of global public goods' consumption are spread out over time and distance. These two issues result in difficulties in funding an effective delivery of global public goods [Kopiński, 2017]. This might be also the reason why ensuring food security for all is “a never-ending story”.

The global economy has experienced several shocks over the past 15 years. The previous crises demonstrated the need for coordinating – within the world trading system – effective governments' responses to the worsening food security situation in a number of countries in the world [Wynne et al., 2020]. Findlay et al. [2020] noticed that the COVID-19 pandemic hit during the period of development of global value chains (GVCs). The authors pinpointed that significant and sudden disruptions to GVCs were caused by the lockdowns, the shutting down of suppliers, and more-restrictive border controls. The breakdown of the logistics sector hit countries across the world. The crisis that emerged has once again sent a signal to ensure a balance in global and regional trade relations, which influences food security at the global, regional, and local levels. The current rules under the WTO arrangements were adapted to the industrial economy of the postwar period. However, they are no longer so good at dealing with the international problems caused by a modern high-tech economy and the development of GVCs [Wynne et al., 2020]. New solutions should be developed with a view to stronger cooperation, better global and regional coordination, and minimization of the risk and destructive effects of emerging crises.

3.2 The WTO agreements on food export restrictions

Export restrictions remain one of the major issues in global agricultural trade, and they became one of the main negotiation areas during the Doha Round in the fields of Non-Agricultural Market Access (NAMA) and agriculture, as well as during the WTO Ministerial Conferences. In general, bans and export restrictions are not allowed under Article XI (General Elimination of Quantitative Restrictions) of the GATT 1994. However, in specific cases, their use is permitted. The following exceptions to the prohibition on applying food export restrictions exist:

- GATT Article XI:2(a): Shortage of food or other vital substances
- GATT Article XI:2(c): Import restrictions on agricultural and fisheries products
- GATT Article XX: General Exceptions [in particular, (g) measures to conserve limited natural resources, (i) measures to guarantee the availability of vital raw materials for domestic processing industries, and (j) measures for the acquisition or allocation of commodities that are in short supply]
- GATT Article XXI: Security Exceptions.

Additionally, in Article XII of the Agreement on Agriculture, there are provisions on export prohibitions and restrictions, which nevertheless require both prior written notification before being introduced and reaching of an agreement among the interested parties. The second paragraph of Article XII states that developing-country members are excused from these obligations, unless the export restricting measure “is taken by a developing country member which is a net-food exporter of the specific foodstuff concerned.” The Agreement on Agriculture also puts a requirement on its members who are planning implementation of new export restrictions on food to thoroughly consider the consequences of such measures to the food security of importing countries. However, these provisions are not realized to a sufficient degree, which leads to disruptions in trade. Why then, as numerous analyses confirm [Sharma, 2011; Howse and Josling, 2012; Korinek and Bartos, 2012], are the WTO regulations ineffective when it comes to export-restricting measures?

There are a couple of reasons for that. First of all, export restrictions can take the form of both tariff and nontariff barriers. Even if nontariff barriers were effectually eliminated, each member country is allowed to implement export taxes in accordance with the WTO regulations, which, when set at a certain level, can render exports unprofitable. Secondly, as Anania [2014] has pointed out, the GATT 1994 text itself and the wording used are unclear, making the enforcement practically impossible. It also lacks provisions on

punishment for ignoring the obligations stemming from Article 12 of the Agreement on Agriculture. Thirdly, there is a significant polarization when it comes to negotiating positions in the WTO caused by the variety of interests of the individual members. As a result, despite problems and issues arising from the use of export restrictions, no satisfactory solutions have been achieved so far.

Since the implementation of the Agreement on Agriculture was completed, the need for solving the issue of export restrictions has been raised multiple times. It has also become one of the negotiating areas in the Doha Round. The initial proposal of building on the results of the Uruguay Round came from the Cairns Group. During the third, failed Ministerial Conference in Seattle, Washington, a proposal was made to strengthen the discipline on the matter of implemented taxes to prevent their escalation, and the need to protect developing net importers of food was emphasized [WTO, 2000c]. These proposals were not widely supported due to the position of several countries that were net exporters of food and used export restrictions (i.e., Argentina, Philippines, Indonesia) [Anania, 2013].

At the turn of the 20th century, both developed and developing countries put forward proposals in the area of export restrictions independently of one another. However, the main focus of these proposals was to maintain export competitiveness. Japan proposed disciplines on export restrictions, e.g., converting them to taxes, which would then be reduced (similar to “tariffication” of import restrictions) [WTO, 2000a]. Switzerland suggested eliminating these completely, but with some flexibility for developing countries [WTO, 2000d]. Other proposals were presented by Jordan [WTO, 2001c], Congo [WTO, 2001a], South Korea [WTO, 2001b], and the USA [WTO, 2000b].

Despite all these submitted proposals, export restrictions were not clearly mentioned as a negotiating area in the Ministerial Declaration in 2001, which initiated the Doha Development Agenda Round. In 2003, the first draft of the “Modalities” was published. Its provisions did not contribute much in terms of export restrictions. Except as provided for in Paragraphs 2(a) and 2(b) of Article XI and Articles XX and XXI of GATT 1994, the institution of new export prohibitions, restrictions, or taxes on foodstuffs was to be prohibited. For developing countries, the disciplines of Article 12 of the Agreement on Agriculture and the relevant provisions of GATT 1994 were to continue to apply. Complicated negotiations and different WTO members’ positions on agriculture during the Doha round constituted the primary factor for the lack of progress in the area of export restrictions as well. One country proposed converting all quantitative restrictions into export taxes, which would be bound and reduced to unspecified levels, with some special and differential treatment to allow developing countries to act in emergencies. Some countries argued that there was no mandate to discuss export taxes and restrictions. Others countered that these measures legitimately come under the heading “export competition”, under Article 20 of the Agriculture Agreement (which deals with post-2000 negotiations) and therefore within the Doha mandate [WTO, 2022].

There were certain changes in 2008 with the emergence of the food crisis when leading agricultural producers began to limit exports. The need to regulate the matter of export restrictions was raised again by Japan and Switzerland. The proposals submitted in April 2008 included tightening discipline of using export-restricting measures and limiting their use to strictly defined situations [Howse and Josling, 2012]. However, the Geneva Ministerial Conference (July 2008) did not bring about a consensus, and the talks were suspended.

The final version of the agricultural modalities was released in December 2008. It contained modified propositions on export restrictions. In order to strengthen the existing disciplines on export prohibitions and restrictions of Article XI.2(a) of GATT 1994, Article 12 of the Agreement on Agriculture shall be modified to include the following elements: (1) Prohibitions or restrictions under Article XI.2 (a) of GATT 1994 in members’ territories shall be notified to the Committee on Agriculture within 90 days of the coming into force of these provisions; (2) a member instituting export prohibitions and restrictions under that provision shall give notice of the reasons for introducing and maintaining such measures; (3) existing export prohibitions and restrictions in foodstuffs and feeds under Article XI.2 (a) of GATT 1994 shall be eliminated by the end of the first year of implementation; (4) any new export prohibitions or restrictions under Article XI.2 (a) of GATT 1994 should not normally be longer than 12 months, and shall only be longer than 18 months with the agreement of the affected importing members [WTO, 2008].

The deteriorating situation of net importers of food due to the food price crises resulted in the intensification of work on the matter in other international organizations (e.g., FAO), groups (The Group of Eight [G8], The

Group of Twenty [G20]), and Net Food-Importing Developing Countries. An attempt to solve the issue of export restrictions was made again during the Eighth WTO Ministerial Conference in 2011 in Geneva. Some proposals were submitted by the least developed countries and some G20 members. They did not change the situation in any significant way, and the negotiations reached an impasse. Other attempts were made during the Ministerial Conferences in Nairobi (2015) and Buenos Aires (2017), giving similar results.

The next Ministerial Conference was postponed due to the global pandemic, but there were some proposals regarding export restrictions put forward in the meantime. The first one was published by Singapore in 2018 as a communication on the consequences of export restrictions [WTO, 2018a]. The subsequent one – containing a review of implemented restrictions – was released jointly by Japan, Israel, Korea, Singapore, Switzerland, and the Separate Customs Territory of Taiwan, Penghu, Kinmen, and Matsu [WTO, 2018b, 2019]. They had no impact on the extent of export restrictions.

3.3 Lessons from the 2007–2008 crisis: Assessment of food export restrictions during the COVID-19 pandemic

In reacting to the COVID-19 crisis, many developing countries decided to introduce temporary export restrictions to mitigate potential shortages in the key supplies of food products (Table 1). Under the GATT/WTO rules, if these countries have a low level of food security, they are exempt from reciprocity [GATT, 1994]. Therefore, they can also shape bilateral trade relations in their own way [Skrzypczyńska²⁰¹⁵]. There are two major types of export restrictions imposed by governments, i.e., quantitative restrictions, such as quotas, and outright export bans [Karapinar, 2010]. An export quota specifies the maximum volume of goods that are allowed to be sold abroad [AgrisPolicyKit, 2019]. The lower the quota is, the similar this measure is to an export ban, which is the government prohibition on exporting certain commodity [AgrisPolicyKit, 2019]. The export bans accounted for >90% of G20 trade restrictions related to the pandemic [WTO, 2021].

The authorities of 27 countries, being responsible for ensuring food security at the country level, imposed food export restrictions in response to the COVID-19 outbreak, which threatened food security. The range of products covered by the restrictions varied from country to country, although bans or quotas usually related to staple foods of high importance in a given society. The export restrictions were applied to only one product in 13 out of 27 countries, whereas seven countries restricted export of >10 foodstuffs in 2020. The use of export-limiting policies for products that are not staple foods (e.g., lemon, beer, wine) cannot be linked to the issue of food security. The limitations were introduced for quite a long time in some countries (>6 months in four cases) (Table 1), which were WTO members, which cannot be justified by the willingness to improve food security during the pandemic. It is doubtful whether the restrictions, when applied for such a long time, really serve to ensure food security internally. The imposed restrictions affected world food trade markedly. It has been estimated that about 5% of globally traded calories were affected [Hepburn et al., 2020].

Hepburn et al. [2020, p. 1] stated that “*access to food for consumers in low-income, food-importing countries could be harmed, as happened when food prices spiked in 2007/08*”. This creates the rationale for referring to the measures applied during the 2007–2008 crisis and their consequences. The 2007–2008 crisis was manifested, inter alia, by a sharp rise in food prices, which triggered a strong response from countries by restricting exports. However, this caused a further increase in international food prices and a deterioration in food security, which became particularly difficult for poor countries [Meléndez-Ortiz et al., 2014]. The export restrictions of 2007–2008 helped stem the rise of food prices in the countries that applied them, but they also resulted in higher food prices in other countries [Anania, 2014]. The question is whether the long-term impact of the 2020 export restrictions on food market and food security will be similar. However, it is difficult now to quantify which consequences are solely the impact of export restrictions imposed due to the COVID-19 crisis or the dual shocks of COVID-19 and the outbreak of war between Russia and Ukraine.

Similar number of countries introduced food export restrictions in 2008 and 2020 (Tables 1 and 2), but the lists of the countries is partly different (Figure 1). In both cases, the measures were applied in developing countries, which are most vulnerable in a crisis situation.

The average duration of export restrictions imposed in 2008 was 139 days. Twenty-four countries introduced restrictions over an 18-month period (Table 2). Exactly half of them (i.e., 12 countries) applied restrictions on export of just one food product to protect the domestic market. Most of the restrictions

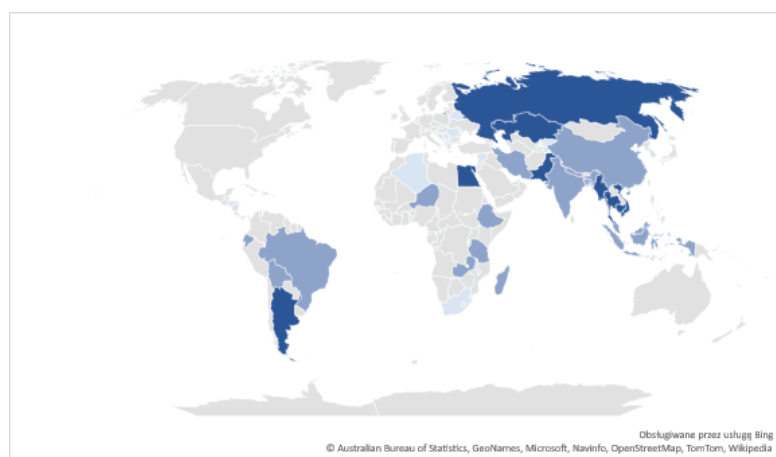


Figure 1. Countries imposing food export restrictions in 2008 and/or in 2020.

Note: Countries that introduced food export restrictions in both periods, viz., 2007–2008 and 2020 – colored with dark blue; countries that introduced such restrictions in 2007–2008 alone – medium blue; countries that introduced the restrictions in 2020 alone – light blue.

Source: Own elaboration based on Tables 1 and 2.

Table 1. Food export restrictions implemented during the COVID-19 crisis

No.	Country	Product	Implementation date	Duration in days
1	Algeria	Semolina, flour, pulses and rice, pasta, oils, sugar, coffee, mineral water, tomato paste, food preparations, milk in all its forms including those intended for children, fresh vegetables and fruits with the exception of dates, red and white meats	V 2020	30
2	Argentina	Maize	XII 2020	60
3	Armenia	Onions, garlic, turnips, rye, rice, buckwheat, millet, cereals, wholemeal and granules from cereal grains, peeled buckwheat, foods prepared from buckwheat, and crushed and uncrushed soybeans	III 2020	81
		Sunflower seeds	VII 2020	61
4	Belarus	Onions, garlic, buckwheat	III 2020	90
		Turnips, rye, rice, millet, cereals, wholemeal and granules from cereal grains, peeled buckwheat, foods prepared from buckwheat, and crushed and uncrushed soybeans	III 2020	81
		Sunflower seeds	VII 2020	61
5	Cambodia	Rice, white rice	III 2020	44
6	Egypt	All pulses, excluding kidney beans	III 2020	30
7	El Salvador	Red beans	III 2020	280
8	Gambia	Rice, sugar, wheat flour, maize flour, millet, fish, vegetables, oils	III 2020	107
9	Ghana	Soybeans	IV 2020	30
10	Honduras	Red beans	III 2020	60

(Continued)

Table 1. Continued

No.	Country	Product	Implementation date	Duration in days
11	Kazakhstan	Buckwheat	III 2020	59
		Potatoes	III 2020	47
		Wheat, rye, including flours and sugar, carrots, turnips, beets, onions, cabbages, sunflower seeds and oil	III 2020	9
		Onions, garlic, turnips, rye, rice, buckwheat, millet, cereals, wholemeal and granules from cereal grains, peeled buckwheat, foods prepared from buckwheat, and crushed and uncrushed soybeans	III 2020	81
		Sunflower seeds	VII 2020	61
12	Kyrgyzstan	Wheat, flour, vegetable oil, sugar, chicken eggs, rice, pasta, onions, garlic, turnips, rye, rice, buckwheat, millet, cereals, wholemeal and granules from cereal grains, peeled buckwheat, foods prepared from buckwheat	III 2020	182
		Crushed and uncrushed soybeans, potatoes	III 2020	61
		Sunflower seeds	VII 2020	81
13	Moldova	Grains	IV 2020	12
14	Myanmar	Rice	III 2020	195
15	North Macedonia	Wheat, meslin	III 2020	38
16	Pakistan	Onions, wheat	III 2020	67
17	Romania	Wheat, barley, oat, maize, rice, wheat flour, soybean, sunflower, seed oil, sugar, and some bakery and pastry products	IV 2020	6
18	Russia	Processed grains, turnips, rye, rice, buckwheat, millet, cereals, wholemeal and granules from cereal grains, peeled buckwheat, foods prepared from buckwheat, crushed and uncrushed soybeans, meslin	III 2020	40
		Onions, garlic, wheat	III 2020	90
		Sunflower seeds	VII 2020	61
19	Serbia	Sunflower oil, molasses, yeast	III 2020	30
20	Sudan	Maize	IV 2020	170
21	South Africa	Spirits	III 2020	12
		Wine	III 2020	14
		Beer	III 2020	21
22	Syria	Eggs, cheese and yogurt, canned and packed cereals and beans	VIII 2020	30
23	Tajikistan	Maize, rice, wheat	IV 2020	153
24	Thailand	Chicken egg	III 2020	7
25	Turkey	Lemon	VIII 2020	145
26	Ukraine	Buckwheat	IV 2020	89
		Wheat	IV 2020	57
27	Vietnam	Rice	IV 2020	20

Source: Own elaboration based on previous works [Laborde et al., 2020b; International Food Policy Research Institute (IFPRI), 2022].

Table 2. Food export restrictions implemented in 2007–2008

No.	Country	Product	Implementation date	Duration in days
1	Argentina	Wheat	III 2008	57
		Rice	III 2008	34
		Soybeans, corn, beef	IV 2008	42
		Grains and oilseeds, soy and sunflower seed, oilseeds and cereal, bovine meat	IV 2008	42
2	Bangladesh	Rice, soybeans, and palm oil	IV 2008	182
3	Bolivia	Maize	IX 2007	360
		Vegetable, grain, and meat	IV 2008	150
4	Brazil	Rice	IV 2008	N/A
5	Cambodia	Rice	IV 2008	60
6	China	Rice, maize, grain powder products	I 2008	270
		Wheat, buckwheat, barley, oats	III 2008	153
7	Ecuador	Rice	I 2008	90
8	Egypt	Rice	IV 2008	182
9	Ethiopia	Cereals, grain	II 2008	90
10	India	Milk powder	XII 2007	N/A
		Maize, non-basmati rice, wheat, and edible oils	III 2008	221
		Pulses	III 2008	365
		Rice	IX 2008	60
11	Indonesia	Key agricultural commodities	IV 2008	153
12	Iran	Wheat	V 2008	27
13	Kazakhstan	Wheat, sunflower seeds, cereals	II 2008	180
14	Madagascar	Rice	V 2008	34
15	Malaysia	Flour	III 2009	30
16	Myanmar	Rice	V 2008	182
17	Nepal	Paddy rice, wheat	IV 2008	192
18	Niger	Key agricultural commodities	III 2008	135
19	Pakistan	Wheat and wheat products	IV 2008	157
20	Russia	Wheat	II 2008	240
21	Tanzania	Key agricultural commodities	II 2008	85
22	Thailand	Rice	VII 2008	N/A
23	Vietnam	Rice	III 2008	90
24	Zambia	Maize	I 2008	243

Sources: Own elaboration based on: [FEWS NET Zambia, 2008a, 2008b; USAID, 2008; Meatz et al., 2011; USDA, 2011; Liapis, 2013; WTO, 2015a, 2015b, 2018c; DG Trade, 2016; ATA, 2019].

ATA, Ethiopian Agricultural Transformation Agency; FEWS NET, Famine Early Warning Systems Network; N/A, no data available; USAID, United States Agency for International Development; USDA, United States Department of Agriculture; WTO, World Trade Organization.

concerned cereals, rice in particular. The mean duration of export restrictions applied in 2008 was longer than it was in 2020, but the range of food products concerned was wider in 2020 than it was in 2008. What is crucial is that a crisis situation was the basis for the governments to decide to impose food export restrictions in 2008 and 2020.

Forty-four countries temporarily introduced food export restrictions in response to the 2007–2008 crisis and/or the COVID-19 pandemic (Figure 1). The problem is that some of the countries imposing food export restrictions in 2008 and/or in 2020 are (together with the United States) among the top five exporters of cereals in the world, e.g., Russia, Ukraine, Argentina, and India (see The Observatory of Economic Complexity

[OECD], 2022). Hence, introduction of measures for protecting the domestic market and food security at a country level affected food supply and international food prices significantly. Every fifth country applied restrictions in both periods (Figure 1), notwithstanding the fact that the 2007–2008 restrictions brought numerous negative consequences for the global population, i.e., food price volatility, food price increases, growing food insecurity of the poor, uncertainty in food supply, and reluctance to invest [Laborde et al., 2013; Anania, 2014]. It confirms the conclusion of Anania [2014] that the issue of food export restrictions is a policy area that is underregulated in the WTO.

Some might think that the introduction of export restrictions in the countries that are not important players in the global food market does not have a significant impact on international markets in both volume and value terms. However, there are times when governments follow other countries' decisions, leaders in particular, including the decisions regarding export measures. It often happens during a crisis situation that has not been known before. In this way, the introduction of food export restrictions is becoming a worldwide issue that has a great impact on the global market. Therefore, it is necessary to monitor all domestic measures restricting trade on the global market, which, even if implemented in countries of minor importance and for a short time, may destabilize the world market [Deuss, 2017]. It is worth adding that the share of exports of agricultural goods from developing countries in the world agricultural export was >40% in 2019 and 2020 [Białowąs and Budzyńska, 2022].

Some research work has been already conducted to assess the impact of the policy measures applied to mitigate the consequences of emerging crises. Hepburn et al. [2020] noted that the food export restrictions imposed in response to the COVID-19 pandemic affected a far smaller share of globally traded calories than it was during the 2007–2008 crisis. The 2007–2008 food export restrictions aggravated the already difficult situation in the food market, which was caused by high energy prices and poor harvests in the countries that were major producers of staple foods. During the first year of the pandemic, there were logistical problems with ensuring the proper functioning of food supply chains due to health restrictions that went beyond the food sector [Hepburn et al., 2020; Wiśniewska and Wyrwa, 2022]. Kym et al. [2013] assessed that the impact of export restrictions introduced over 2007 and 2008 on both domestic and international markets was negative. Sudden changes in the world food supply of 2007–2008 contributed to price volatility and price increases, causing losses to all countries, but in particular the largest food importers [OECD, 2020]. It can be expected that the consequences of food export restrictions implemented in 2020 have been similar. Thus, food security is most at risk in countries that are heavily dependent on food imports [OECD, 2020]. Casey and Cimino-Isaacs [2021] have mentioned that the reduction of crucial supplies from most leading food exporters threatens integrated supply chains, due to a large dependence of some countries on imports. Falkendal et al. [2021] have stated that many low-income countries in Africa and Asia have not been able to buffer the sudden decline in grain supply caused by export bans with their national reserves. Food export restrictions affect the world economy as a whole, and the entire food industry, since the reduction in the supply of food on the world market limits both the quantity of basic foodstuffs and the delivery of intermediate products for further processing [Casey and Cimino-Isaacs, 2021].

The FAO Food Price Index, which is a measure of the monthly change in international prices of a basket of food commodities belonging to the categories of cereals, vegetable oils, sugar, meat, and dairy products, averaged 125.7 points in 2021, up 28.1% from 2020. This percentage change was the highest since 2007. What is more, the 2021 index reached the highest level for a decade. The FAO Food Price Index increased by 29.9% over the period between 2006 and 2007 and by 24.6% between 2007 and 2008 [FAO, 2022], which confirms the findings by Meléndez-Ortiz et al. [2014] showing that 2007–2008 export restrictions were implemented in response to the food price spikes and further pushed them up. It is worth noticing that the 2020 trade restrictions did not play a key role in international food prices increases as was the case during 2007–2008 and 2010–2011. The upward trend in food prices in 2021 was also caused by higher prices of fertilizers, the depreciation of the US dollar, and rising freight costs [Vos et al., 2022]. Rapidly rising input prices, especially those of energy derived from fossil fuels, further pushed up food prices in 2021 [FAO, 2021b]. Food price increases are challenging food security. Higher food prices have caused both food insecurity and deterioration of diets. The poor in low-income and net-food-importing countries have been most affected [Espitia et al., 2021; Vos et al., 2022].

In order to assess the effects of the 2020 food export restrictions on food security at a country level, the changes to the GFSI might be considered (Table 3). The GFSI allows the assessment of the efficiency of the food security system of a country. The index is made up of four pillars: affordability, availability, quality and safety, natural resources and resilience. GFSI lies within the range of 0–100. Greater volatility in food prices since 2019 have affected affordability the most. The following parameters have been considered for affordability: change in average costs of food, share of population under the global poverty line, GDP per capita, agricultural import tariffs, food safety programmes, and access to financing for farmers [Economic Impact (EI), 2022].

It is worth underlining that the countries that imposed restrictions in 2020 are developing countries with relatively low GFSI scores. In 2021, out of 113 countries, the highest overall score was for Ireland (84.0), Austria (81.3), and the United Kingdom (81.0). Comparison of the country-specific GFSI values of 2021 with the figures of 2020 shows that the food security situation in more than half of the countries considered (52%) has improved, i.e., Algeria, Argentina, Belarus, Cambodia, Egypt, El Salvador, Honduras, Myanmar, Russia, Serbia, Sudan, Thailand, Turkey, and Ukraine. However, there are still eight countries (including

Table 3. Changes in GFSI scores of countries that imposed food export restrictions during the COVID-19 pandemic

Country	GFSI		
	2020	2021	Change 2021/2020
Algeria	61.6	63.9	+2.3
Argentina	63.1	64.2	+1.1
Armenia	N/A	N/A	N/A
Belarus	70.4	70.9	+0.5
Cambodia	51.3	53	+1.7
Egypt	59.8	60.8	+1.0
El Salvador	57.8	59.5	+1.7
Gambia	N/A	N/A	N/A
Ghana	52.8	52.0	-0.8
Honduras	58.1	59.4	+1.3
Kazakhstan	71.9	69.2	+2.7
Kyrgyzstan	N/A	N/A	N/A
Moldova	N/A	N/A	N/A
Myanmar	54.0	56.7	+2.7
North Macedonia	N/A	N/A	N/A
Pakistan	55.7	54.7	-1.0
Romania	73.8	72.4	-1.4
Russia	73.9	74.8	+0.9
Serbia	61.2	61.4	-0.2
Sudan	36.4	37.1	+0.7
South Africa	58.0	57.8	-0.2
Syria	39.5	37.8	-1.7
Tajikistan	52.5	51.6	-0.9
Thailand	63.6	64.5	+0.9
Turkey	61.2	65.1	+3.9
Ukraine	58.8	62.0	+3.2
Vietnam	62.7	61.1	-1.6

Source: Own elaboration based on reports [EI, 2022].

EI, Economic Impact; GFSI, Global Food Security Index; N/A, no data available .

Ghana, Kazakhstan, Pakistan, Romania, South Africa, Syria, Tajikistan, and Vietnam), wherein the food security situation deteriorated despite the restrictions imposed by the governments (see bolded values in Table 3). Thus, it seems that food export restrictions are not universally efficient measures for improving food security internally, and the WTO rules for export restrictions should be rethought – as suggested by Anania [2014] previously. The analysis of GFSI values conducted in the light of social and economic issues of a very complex nature questions whether food export restrictions have been sufficient measures given the size of the food security challenge during the pandemic.

4 Conclusion

The application of numerous mitigation measures during the COVID-19 pandemic resulted in the “locking down” of economies and had a negative impact on food and nutrition security, particularly for the poorest members of the global society. Food security is a public good. Furthermore, everyone has a right to adequate food. Thus, every country is responsible for ensuring food and nutrition security for all. Since global food security is a global public good, the development of international cooperation in order to provide it is necessary. In times of crisis and growing food security challenges, the governments of developing countries, which are most vulnerable, decided to introduce food export restrictions in 2007–2008 to prevent rises in domestic food prices and, in 2020, to mitigate potential food shortages. These resulted in pushing international food prices up and growing food supply chain uncertainty, which often leads to reluctance to invest in agriculture and the food industry.

The COVID-19 crisis situation has revealed again that food scarcity has not been the major cause of growing hunger and food insecurity in most of the countries worldwide. The most problematic issue has been to ensure food affordability. The combination of sharp rises in food prices, exacerbated by food export restrictions and widespread losses of income due to quarantine obligations, has contributed to a large increase in the prevalence of undernourishment. Hence, the implementation of food export restrictions cannot be justified by anticipated food shortages.

The recent international crises, both the financial crisis of 2007–2008 and the COVID-19 crisis, have exposed the weaknesses in the international framework for regulating food trade within the WTO. In general, the implementation of food export restrictions by the governments of the WTO members is forbidden. However, there is a list of exemptions to this prohibition. The problem is that the wording of the provisions in Article XI of GATT is vague and makes its enforcement impossible. In the WTO, there are no efficient mechanisms that would prevent unjustified use of the measures. Moreover, the area of food export restrictions is neglected by the WTO since other strategic elements of agriculture and agricultural policy are the focus of WTO negotiations and agreements. Due to the existing differences in the interests of the WTO members, it is difficult (or even impossible) to establish a common position on this. The negotiating power of net-food-exporting countries is usually very strong, whereas the group of net-food-importing countries is inconsistent and unable to work out a common position. As a result, despite the numerous rounds of talks, the issue of food export restrictions is underregulated in the WTO.

Consequently, food export restrictions have been still applied in times of crisis and have had a large economic impact but also have had a significant social impact. The economic effects include distortion of competition, food price volatility and increases, food supply chain uncertainty, lower level of investment in food industry, and the decrease of incomes and wages of people working in the food industry. The social effects include lower level of food and nutrition security across countries, in particular, the poor in low-income and net-food-importing countries. Furthermore, it is doubtful whether food export restrictive measures work to improve food and nutrition security situation in the countries that applied them, as shown in the analysis of GFSI scores.

It should be stressed again that a wide variety of factors affects food access, availability, stability, and food utilization in times of crisis but also during the economic recovery. The authors have reflected on the effects of introducing agricultural export restrictions on food security (particularly food prices) and have not assessed many other existing cause–effect relationships – mainly due to a lack of sufficient data, and this

is a limitation of the study. Since it is vital to ensure food security in times of crisis, the analysis has been conducted despite doubts regarding whether the values of GFSI represent correctly the real situation or not.

Furthermore, the analyses have focused on food export restrictions (time and place of their introduction, products affected, WTO rules, and so on) without taking into account trade flows. Thus, it has been rather impossible to accurately assess the impact of the agricultural restrictions implemented in 2020 on food systems and food security. This needs further investigation in future studies for the purposes of better regulation and policy-making.

The crisis caused by the COVID-19 pandemic and the application of numerous mitigation measures have deteriorated the state of food security in many developing countries, including, inter alia, Rwanda, Uruguay, Laos, Burundi, Sri Lanka, Kazakhstan, and Côte d'Ivoire [EI, 2022]. Since several African countries (e.g., Laos, Somalia, Egypt, and Sudan) are highly dependent on wheat imports from Russia and/or Ukraine, the disruptions in the Black Sea region, which started with the outbreak of war in February 2022, have led to increasing food insecurity there [Statista, 2022]. Russia and Ukraine supply 30% of wheat and 20% of maize to global markets, and Ukraine alone supplies more than half of the wheat to the UN's World Food Programme [WFP, 2022]. The conflict has put further pressure on the already elevated international prices of wheat and other foodstuffs. In developing countries, where food expenditure shares have been high, food price spikes have been significantly reducing access to food. Global food security implications of the conflict in Ukraine and the development of new mitigation measures should be a subject of further studies. The existing policies on food self-sufficiency across the world should be reconsidered.

Since there is still no WTO agreement on food export restrictions and because the frequency of global crises affecting agricultural and food markets is increasing, this issue needs to be urgently addressed by another institution. One of the options is to develop a code of conduct within the framework of the FAO, e.g., to include the issue of food export restrictions in *Codex Alimentarius*. However, the problem that arises is to have an effective mechanism to enforce compliance with the rules, requirements, or guidelines. The development of a code of conduct regarding food export restrictions could be also a focus of further studies.

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